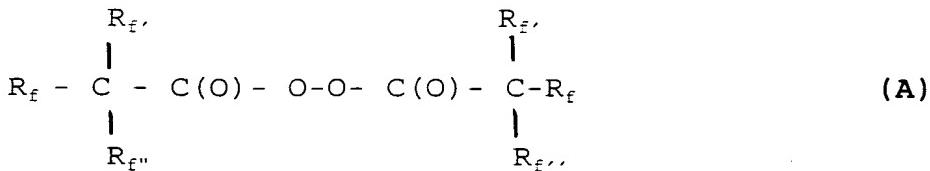


CLAIMS

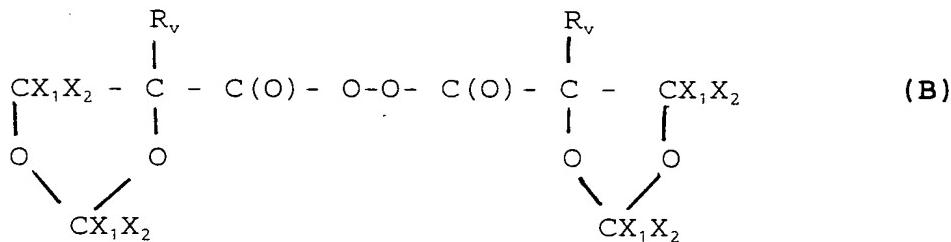
1. Perfluorodiacylperoxides having the following structures:



wherein:

when R_f is F, R_f' , R_f'' are both $-CF_3$;

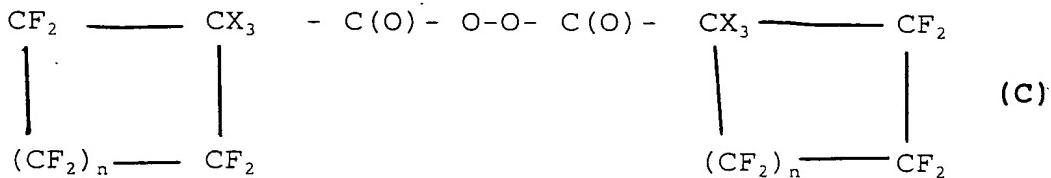
when R_f is $-CF_3$, R_f' and R_f'' are C_1-C_3 linear or branched perfluoroxyalkyl groups;



wherein:

R_v is selected from F, perfluoroxyalkyl, C_1-C_3 linear or branched perfluoroalkyl;

X_1, X_2 are selected from F, perfluoroalkyl, C_1-C_3 linear or branched perfluoroxyalkyl.



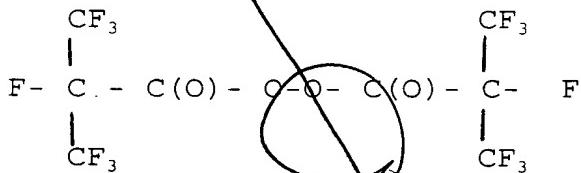
wherein:

$n = 1-3$

X_3 is selected from F, C_1-C_3 linear or branched perfluoro-

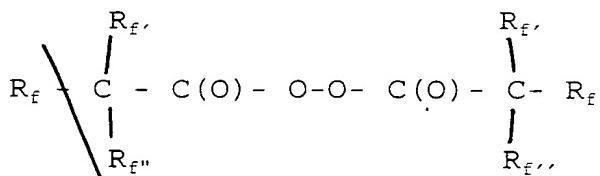
alkyl, with the proviso that for $n = 3$, X_3 cannot be F; said perfluorodiacylperoxides meet the following condition: the thermal decomposition constants K_d (sec^{-1}) in the presence of water do not undergo substantial variations with respect to the thermal decompostion constants in absence of water.

2. A polymerization process of one or more fluorinated monomers wherein the perfluorodiacylperoxides according to claim 1 are used as polymerization initiators.
3. A polymerization process according to claim 2, wherein the polymerization is carried out in aqueous medium, in suspension, in emulsion or in microemulsion.
4. A polymerization process according to claims 2-3, wherein at temperatures of the order of $50^\circ\text{-}80^\circ\text{C}$, the perfluorodiacylperoxides of structure (C) or the compound of structure (A) having the formula:



are used.

5. A polymerization process according to claims 2-3, wherein at temperatures of the order of $-20^\circ - +25^\circ\text{C}$, the perfluorodiacylperoxides of structure (A) of formula:



are used, wherein when R_f is $-CF_3$, $R_{f'}$ and $R_{f''}$ are C_1-C_3 linear or branched perfluoroxyalkyl groups.

6. A polymerization process according to claims 2-5, wherein the fluorinated monomers are selected from:

- C_2-C_8 perfluorolefins, such as tetrafluoroethylene (TFE), hexafluoropropene (HFP);
- C_2-C_8 hydrogenated fluoroolefins, such as vinyl fluoride (VF), vinylidene fluoride (VDF), trifluoroethylene, $CH_2=CH-R_f$ perfluoroalkylethylene, wherein R_f is a C_1-C_6 perfluoroalkyl, hexafluoroisobutene;
- C_2-C_8 chloro-fluoroolefins, such as chlorotrifluoroethylene (CTFE);
- $CF_2=CFOR_f$ (per)fluoroalkylvinylethers (PAVE), wherein R_f is a C_1-C_6 (per)fluoroalkyl, for example CF_3 , C_2F_5 , C_3F_7 ;
- $CF_2=CFOX$ (per)fluoro-oxyalkylvinylethers, wherein X is: a C_1-C_{12} alkyl, or a C_1-C_{12} oxyalkyl, or a C_1-C_{12} (per)fluoroxyalkyl having one or more ether groups;
- perfluorodioxoles, such as 2,2,4-trifluoro-5-trifluoromethoxy-1,3-dioxole (TTD), 2,2-bis-trifluoromethyl-4,5-difluoro-dioxole (PPD);

- sulphonic monomers, such as $\text{CF}_2=\text{CFOCF}_2\text{CF}_2\text{SO}_2\text{F}$;
 - fluorinated dienes such as $\text{CF}_2=\text{CFOCF}_2\text{CF}_2\text{CF=CF}_2$,
 $\text{CF}_2=\text{CFOCCl}_2\text{CF}_2\text{CF=CF}_2$, $\text{CF}_2=\text{CFOCF}_2\text{OCF=CF}_2$,
 $\text{CF}_2=\text{CFOCF}_2\text{OCCl=CF}_2$, $\text{CF}_2=\text{CFOC}(\text{CF}_3)_2\text{OCF=CF}_2$.

7. A polymerization process according to claims 2-6, wherein the perfluorodiacylperoxide initiator is fed in a continuous way or by a single addition at the starting of the polymerization.

8. A polymerization process according to claims 2-7, wherein the amount of perfluorodiacylperoxide initiator is in the range 0.0001%-5% by moles with respect to the amount of the fed monomers.

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